



Efficiently Navigating Today's Market Reality



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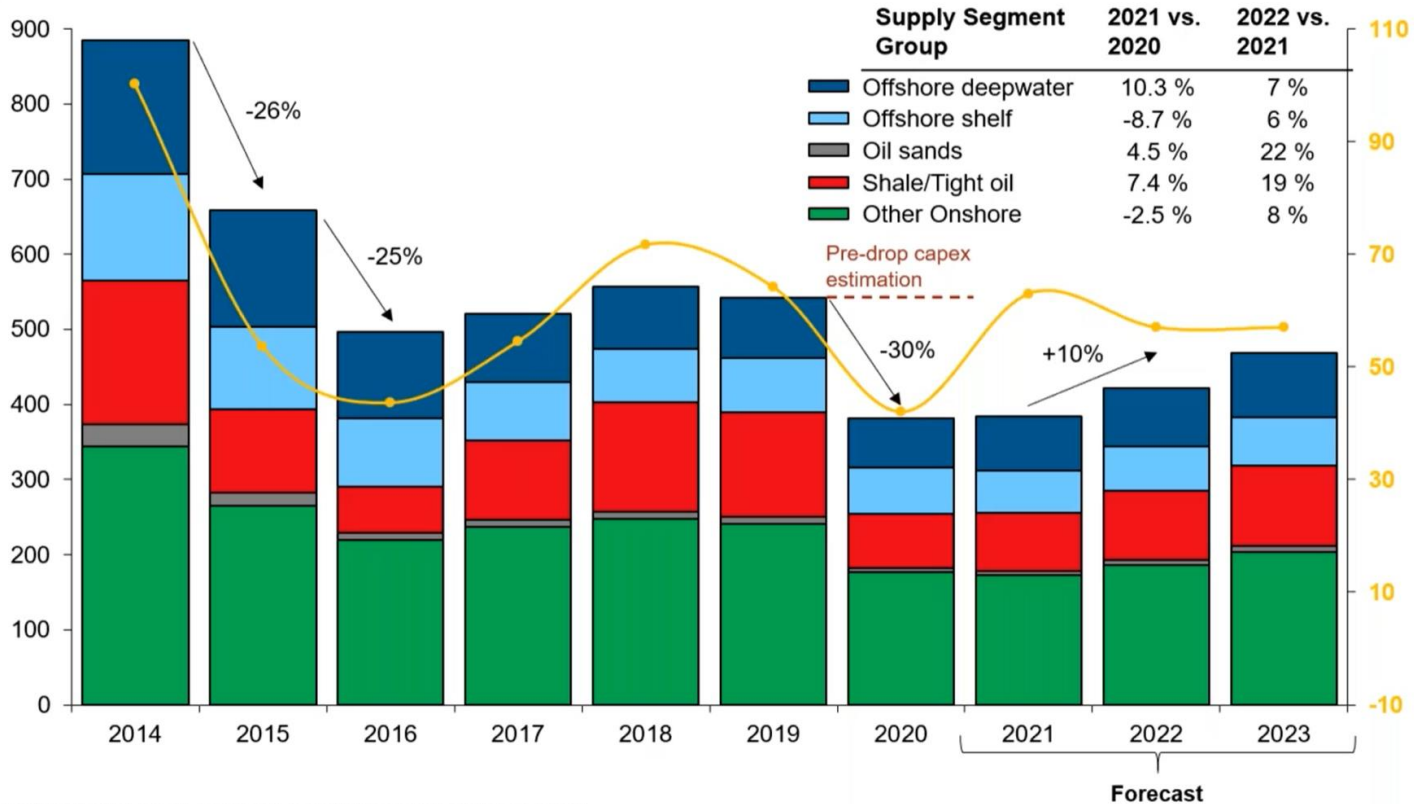
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Back to Back Industry Downturns

Global E&P investment by supply segment vs Brent oil price
Billion USD (LHS)

USD per barrel (RHS)



*Capital investments only include organic spending on upstream operations (Capex and Expex)
Source: Rystad Energy UCube

The Real Challenge is OpEx

- Data rates are growing faster than MHz prices are declining
- Digital Transformation projects accelerated in the Pandemic

New Digital Transformation Initiatives

Equinor and Shell collaborate on digital solutions

bp and Microsoft form strategic partnership to drive digital energy innovation and advance net zero goals

Baker Hughes Digitally Transforming Oil Fields With Connected, Intelligent Hardware

World Oil Magazine

Halliburton, Microsoft and Accenture form agreement to advance digital capabilities

Digital transformation

We are accelerating the digital transformation of the energy industry. With our broad portfolio of technologies and solutions ranging from sensors and edge analytics to enterprise-scale Artificial Intelligence, we help our customers get better data and make better decisions.

Remote Operations Growing Rapidly

Company	Remote operations 2Q20
Schlumberger	75%
Baker Hughes	72,000 jobs

Benefits	Way forward
Cost reduction	Data transmission
Ensure safety	Multiskilled crew
Enhance collaboration and efficiency	Organizational change

PTEN has the Expertise for Automation and Remote Operations

RIG AUTOMATION: APEX, CORTEX, PTEN, CURRENT

REMOTE OPERATIONS: CORTEX, PTEN

THE WALL STREET JOURNAL

Drillers Go Remote as Pandemic Reshapes Oil Business

Offshore Norway Used Performance Live Service to Acquire Formation and Well Integrity Evaluations

Transform legacy-job support models into an industry-leading digital operating environment

A dedicated performance software suite and advances in our downhole equipment work seamlessly with our technology and service portfolios to offer workflows for all traditional wellsite roles. This helps eliminate many physical tasks, and thereby reduces personnel on board and associated HSE exposure. No longer required at the rig site, engineers are instead linked via the robust Schlumberger data network that integrates technology and a collaborative digital ecosystem, which automates common processes so engineers can focus on improving customers' performance.

The Hidden Cost of Inefficiency

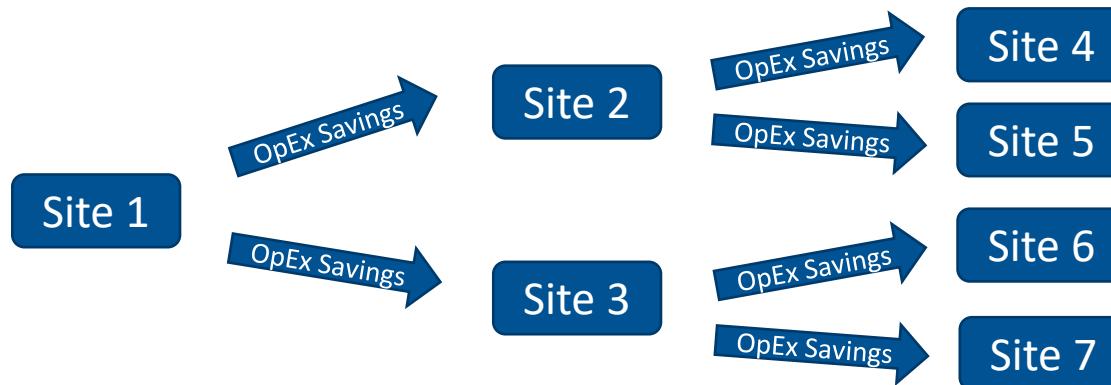
- Those VSATs were put in back in the good old days
 - Still working, but aging
 - Inefficient use of space segment increases OpEx
 - Limited Horsepower to support growing demands
1. If you **Replace**, then you have a **CapEx Issue**
 2. If you **Don't Replace**, then you have an **OpEx Issue**

How can you improve operational efficiency
without major CapEx expenses?

A Better Way

- Our Oil and Gas customers are finding the answer in Comtech EF Data's SCPC Technology
 - Superior Efficiency = reduces bandwidth costs
 - High Horsepower = support for demanding applications
 - No expensive hub = minimizes up front costs
- Upgrade one site at a time to spread CapEx expenses

OpEx Savings funds the next round of CapEx:



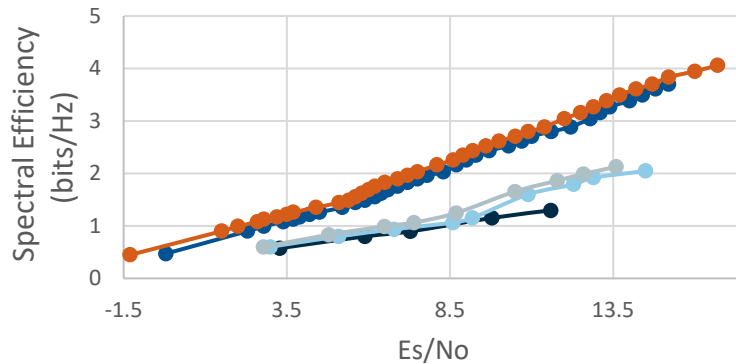
Brazil Offshore Case Study

- Legacy TDMA Network serving 9 offshore deployments
- Need to increase data rates to meet new regulations for crew Internet
- Solution: Upgrade to Comtech SCPC
- Improved spectral efficiency from 1.75 bits/Hz to 7.7 bits/Hz (440%)

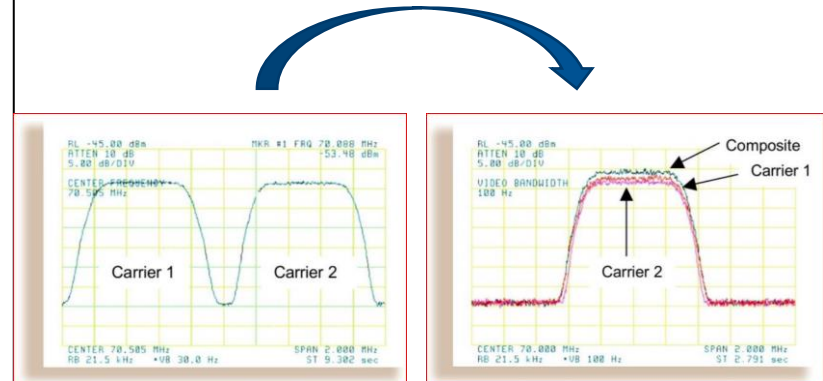
	Legacy TDMA	Comtech SCPC
Modulation	16APSK/QPSK	32APSK
Carrier in Carrier	No	Yes
Roll-off Factor	20%	5%
Spectral Efficiency	1.75	7.7
Payback Period	2 months	

Efficiency is the Answer

High Spectral Efficiency



DoubleTalk Carrier in Carrier



True Bi-directional ACM

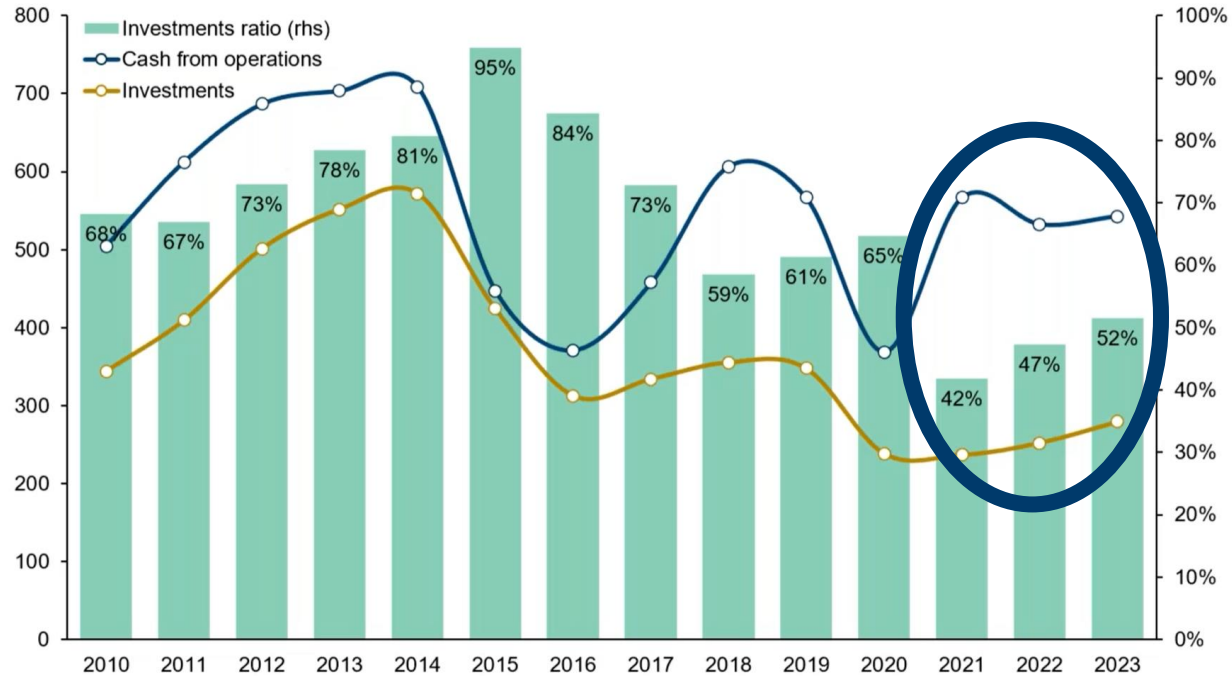
- Optimize every site, all of the time
- Higher uptime performance
- Maximizes clear sky throughput
- Fully integrated with QoS

Best in Class Link Optimization

- Header Compression
- Payload Compression
- Internet Protocol Optimization
- Mobile Network Optimization

A good year for Cash Flow

Cash from operations, investments and investment ratio for all public E&P companies
Billion USD

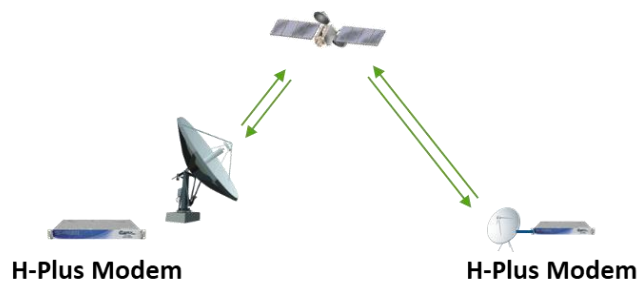


Source: Rystad Energy UCube

Strong cash flow indicates that the next upcycle is coming, so be prepared.

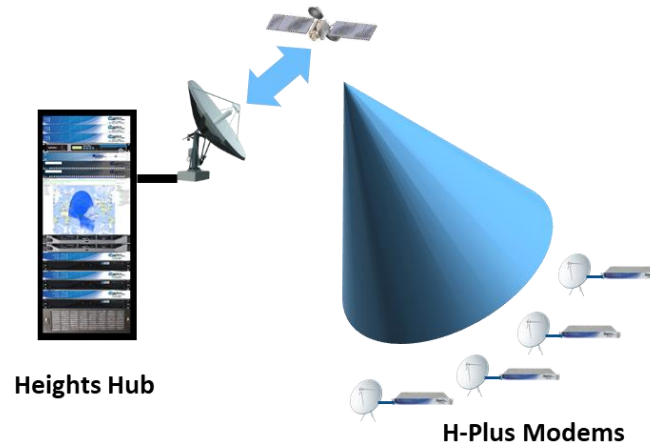
H-Plus Dual Mode Support

H-Plus Point-to-Point SCPC Mode



- Static SCPC TX and RX Carriers
- Supports Carrier-in-Carrier
- No hub needed

H-Plus Heights Network Mode



- Fully Managed Hub
- Shared Outbound
- Dynamic H-DNA Return Carriers

Super Efficient SCPC for today, with a migration to Heights VSAT tomorrow

Summary

- Freezing CapEx budgets won't get you through the Pandemic, and won't support digital transformation.
- Strategic investments in efficiency can both support new digital applications and also reduce OpEx.
- The current industry high free cashflow will enable the next up cycle, so be prepared or you will miss it.

The H-Plus Dual Mode modem provides a cost effective way to modernize networks today and transition to growth tomorrow.



Market Leading Bandwidth Efficiency and Link Optimization



www.comtechefdata.com